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Brigitte Blom Ramsey
University of Kentucky

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Public Provision of Services for the Elderly:

**An Empirical Analysis of County-Level
Senior Service Property Tax Levies**

Brigitte Blom Ramsey
University of Kentucky
Martin School of Public Policy & Administration

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I. Executive Summary

Last year the baby boom generation began turning 60. Consequently, the number of senior citizens is expected to double by the year 2030. On average, a person reaching the age of 60 can expect to live an additional 22 years. (NCHS, 2003) Along with increased life expectancy comes a greater probability for chronic illness, physical impairment and loss of independence. Of those 85 and older, 55% will need some type of long-term care or personal assistance. (CBO, 2004)

A recent collaborative study, “The Maturing of America: Getting Communities on Track for an Aging Population”, notes that less than half of local communities have begun to address the needs of an aging population.

The following research is an empirical analysis of Ohio’s experience levying county property taxes to provide local services for the elderly. Specifically, this study assesses the validity of two concerns raised by critics of senior service property taxes. First, that such levies allow the senior citizen population to redistribute tax money toward their own self-interests. Second, that senior service levies will compete with local education levies and have an adverse effect on local per pupil revenue. Practitioners believe that the public exhibits a general willingness to pay for the provision of senior services and that the key determinant to levy passage is effective campaigning.

There are a variety of papers published by advocates of Ohio’s senior service property tax levies. These papers provide extensive overviews of the local services provided by the levies, instructions on setting up campaigns, service outcome measures, and implementation designs. But, there is no empirical analysis to assess determinants to levy passage or to measure the validity of critics and practitioner’s suspicions. Drawing largely on education levy literature to design hypothesis models, this research provides such an empirical analysis.

Through regression analysis and two hypothesis models, my results conclude that critics concerns are unfounded. The proportion of senior citizens appears not to have a statistically significant and positive effect on the percent voting ‘yes’. In addition, the proportion of senior citizens and the presence of a senior service levy have a statistically significant and positive impact on local per pupil revenue.

There are five states that have local level property taxes to support senior services. This research suggests that in Ohio, critics concerns are unsubstantiated and that practitioners may be correct in assuming a general willingness to pay. To provide a more generalizable assessment of these findings further research is warranted.

II. Identification of the Problem

Much interest in the swelling of the elderly population has been paid at the national and state level, as political agendas include rethinking the delivery of Social Security and Medicare/Medicaid. Yet, at the local level, where the impacts will be felt most directly, there has been little local government attention to the needs of an elderly population. In fact, according to a recent collaborative report, entitled “The Maturing of America – Getting Communities on Track for an Aging Population”, fewer than half of towns, counties and municipalities across America have begun to look at the impact of on aging community.

The following research focuses on county level governments that have tailored public services for the elderly and provided local funding to do so. Specifically, this research looks into Ohio’s experience levying county property taxes to fund a myriad of senior services. This research seeks to answer three specific questions raised by critics and concerned policymakers. **What services are extended and to whom? What county characteristics predict the passage of senior service levies? What effect do senior service levies have on the passage of competing education levies?**

Critics argue that spending on seniors may come at the expense of other age groups, specifically children. (Applebaum, 2005) Contributing to the argument is research that documents a decrease in support for local education levies by older voters. (Poterba, 1997 and Ladd, 2001). In addition, some economists suspect that the high passage rate for senior service levies is merely a reflection of an active senior voting population,

allowing seniors to act as a special interest group, effectively redistributing tax dollars to their own self-interested needs.

Practitioners believe that there is a general willingness to pay for senior services by the voting public and that the key determinant is educating the public. (Burnett, 2007)

Further, it is my hypothesis that there may exist a “symbiotic” tax-benefit effect between senior service levies and public education levies. Such a hypothesis contradicts the suspicion by critics that the presence of senior service levies will prove to crowd out funding for education. This research seeks to determine if there is any validity to the idea that voters approach the ballot with a social compact in mind – if you support my needs, I will support your needs. There exist no theoretical or empirical work to suggest a possible “symbiotic” tax-benefit effect. This work seeks to establish such, given the combination of senior service levies and public education levies in Ohio.

The following study increases the available information concerning funding of senior service programs through property tax levies, given competing local level interests. Publications exist that encourage policy makers to consider property tax levies as a funding stream for senior services. (Applebaum et al, 2000) An implementation design has been published outlining the increased service availability for seniors through property tax funds. (Applebaum et al, 1997) However, no empirical analysis exists that identifies determinants of the passage of senior service levies or assess the possible competition between different local levies.

III. Background

Projected Needs

The baby boom generation, those born between 1946 and 1964, began turning 60 last year. The number of people over age 65 in the United States will exceed 70 million by the year 2030, nearly double the number currently, according to the National Association of Area Agencies on Aging. In addition, those in the baby boom generation are the beneficiaries of success in health care that has extended life expectancy. Those reaching age 60 by 2003 can expect to live, on average, an additional 22 years. (National Center for Health Statistics, 2003). Unfortunately, coupled with increased life expectancy is the increase in the probability of chronic health issues requiring a variety of ongoing health service.

“The Maturing of America – Getting Communities on Track for an Aging Population, as well as various statewide needs assessments such as the Kentucky Elder Readiness Initiative (KERI), finds the following eight specific areas where service delivery may be needed:

- Healthcare – elders often do not have access to regular health screenings, prescription drug counseling or health education. The issue of low levels of healthcare is exacerbated in communities where lower middle-income elders, not eligible for the means tested Medicaid program, rely solely on Medicare for health benefits.
- Nutrition – Eighty percent of communities currently provide home-delivered meals to the elderly. Participation in this program can be expected to increase as the elder population expands.

- Exercise – Few elders have access to fitness programs that may help to mitigate the onset of chronic health conditions requiring public expenditure.
- Housing – Currently just half of 1,790 communities surveyed have programs for home modification that help the elderly stay in their homes.
- Work force development – With life expectancy increasing, many retirees may have the need or desire to continue working. Currently less than 40% of communities offer job training or retraining.
- Human Service – Although there may seem to be a great variety of programming for the aged, few communities have a central point of communication about service availability.
- Transportation – as elders lose the ability to drive, transportation becomes a great need.
- Long-term and In-home care – Approximately 19% of seniors experience some type of physical impairment. At age 85 and over, 55% will need some type of long-term care or personal assistance. (CBO, 2004)

Funding Services for Senior Citizens

Robert Applebaum and colleagues at the University of Miami – Ohio, advocate for tax levies in a 2003 publication entitled, “Using Local Tax Levies to Fund Programs for Older People: Good Politics and Good Policy?” Applebaum illustrates the use of such levies in Ohio and cites similar levies in Michigan, Kansas, Louisiana, and North Dakota. According to Applebaum, metropolitan areas such as Hamilton County have generated tax dollars in excess of \$18 million per year. Non-metropolitan counties generate \$9,000 to \$860,000 with mean revenue across non-metropolitan areas of \$250,000 annually. By

design, these tax dollars go directly to fund services for senior citizens, as opposed to human service tax levies that are divided among competing needs.

Currently, 62 of Ohio's 88 counties have levies exclusively supporting aging related programs. In addition Michigan, Kansas and North Dakota all had more than 60% of their counties levying a senior support tax in 2003. Levy renewals drew even more support than the initial vote, winning by a margin of 60-80 percent. (Applebaum, 2003)

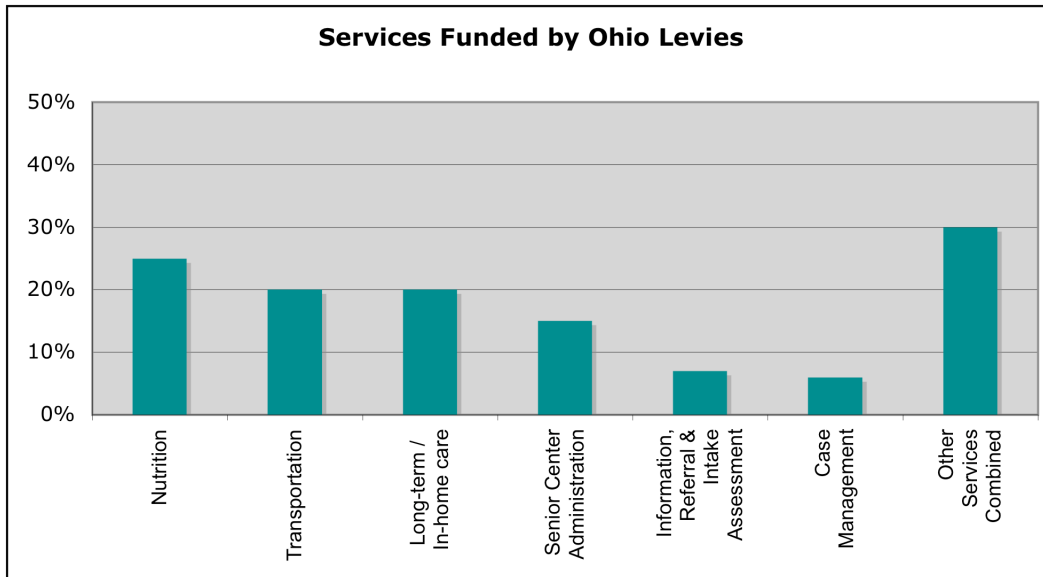
Services Provided through Levy Funds

The services provided to seniors with the revenue from local property tax levies encompass all areas noted in the aforementioned needs assessments. The fact that revenues and expenditures are supported at the local level allows local agencies to tailor programs to meet the needs of their distinct elder population. Counties spend significant portions of their budgets on specific program areas, such as nutrition, long-term and in-home care, exercise, recreation, and travel. Rural counties spend significant portions of their budget on travel. (Applebaum, 2006)

Counties are able to provide additional services by using the senior service property tax levy revenue to leverage additional matching funds. Sources of additional funding include, the Older American's Act, United Way, Senior Community Services Fund, the Alzheimer's Association, and the United States Administration on Aging's *Nutrition Services Incentive Program* (NSIP). (Applebaum, 2006)

Approximately one-third of Ohio counties require, or accept voluntary, cost sharing by clients that are above 150% of the poverty rate. Another one-third receive donations, both solicited and unsolicited.

Figure 1



Source: Applebaum, 2006

* Other services includes: adult day services; caregiver services; home modifications and repair; home medical equipment; emergency response systems; active aging programs; adult protective services; volunteer coordination; medical claims assistance; prescription drug assistance and mental health.

IV. Literature Review

Ohio was the first of only five states to incorporate a senior service property tax levy at the local level. The research that exists is an overview of Ohio's experience regarding levels of revenue and types of service. No empirical analysis has been performed to further understand the seemingly popular senior service levies. What is available is research that looks at the support for local education levies in general and determines

levels of support by different age groups. It is from this research that I build my models to further understand this topic.

Determining Support for Local Levies

In 2005, the New York State Education Department produced a study looking at risk factors associated with school budget vote failures. The study documents association between the percent voting “no” on the budget issue and the percent change in the tax levy. There was also association between the percent voting “no” and the local effort rate.

Another recent study was performed to determine support for a local school bond issue. The study used the percent that supported the issue, determined through a survey, regressed on a variety of socio-economic indicators. (Tedlin et al, 2001) Demographic variables that proved significant in their model include; age, income, education, and whether the respondent owned or rented property. The explanatory variable of interest was the racial identity of the voter. Age proved to have a negative effect on the support for the local education bond among whites, but not for other racial groups.

Intergenerational Conflict and Tax Linkages

The research on racial identity and support for local education supports previous research on the extent to which older voters support school levies. Initial research was performed using state-level average revenue per pupil regressed on the population share 65 and older. (Poterba, 1997) The study controlled for the school age population and the share of the population that was nonwhite. The results suggested that per pupil

revenue was substantially lower in states with a greater share of the population over the age of 65.

Helen Ladd and Sheila Murray (2001) extended Poterba's analysis to the county-level and controlled for a variety of demographic variables. They used county-level per pupil revenue regressed on the proportion of seniors, while controlling for home ownership, the proportion of nonwhites, the percent of the population that was urban and median household income. Ladd and Murray also found that an increased proportion of the population age 65 and over had a negative effect on revenue per pupil at the local level.

V. Empirical Analysis

Research Design and Data Collection

I use a combination of the designs described above to provide models for my analysis. The unit of observation is Ohio counties and the control variables are the same in both models: the proportion of children, the percent of the population that is nonwhite, the percent of the population that is urban, homeownership, and median household income.

Model # 1

To assess the determinants to passage of senior service levies, I use a model similar to the design of Tedlin et al and the New York Education Department. My dependent variable is the percent voting 'yes' on the senior service levy. My explanatory variables

of interest are the percent of the voting age population that is 65 and over and the local tax rate requested by the senior service levy.

$$\% \text{SENIOR LEVY VOTE} = \text{TAX RATE} + \%65 + (\text{CONTROL VARIABLES})$$

The years of observation are May 2000 – November 2006. There are a total of 98 observations; 87 levies passed and 11 failed. The data set represents 62 of Ohio's 88 counties.

Table 1 – Bivariate Correlations – Determinants to senior levy passage

N = 98	Votes for Levy	Tax Rate	%65 of Voting Pop	%5-17	Med. HH income (1999)	% Owner occupied	% Non white	% Urban
Votes for Levy	1							
Tax Rate	-0.2603	1						
%65	0.1560	-0.2675	1					
%5-17	-0.1586	-0.0116	-0.0897	1				
Income	-0.1542	0.2615	-0.4894	0.4708	1			
%Own	-0.0641	-0.1335	0.1991	0.5537	0.3414	1		
%Nonwhite	-0.0090	0.1143	-0.0591	-0.2309	0.0293	-0.6084	1	
%Urban	-0.0200	0.2835	-0.1065	-0.3060	0.2999	-0.5375	0.6472	1
Mean	62%	0.67	18%	19%	\$39,817	75%	6%	53%
Std. Dev.	9%	0.40	3%	2%	\$8,060	5%	5%	21%
Minimum	38%	0.10	11%	13%	\$27,287	57%	1%	2%
Maximum	81%	3.30	24%	25%	\$67,258	87%	27%	98%

Table 1 shows a negative relationship between the tax rate and votes for the levy. This is the expected sign. We expect that as the tax rate increases people exhibit a decreased willingness to pay. This assumption also holds true for the 65 and over voting population. The sample population is largely white and middle-income homeowners. Just over half of the sample population is in an urban area.

Model #2

To assess the impact of senior service levies on education levies, I derive my model from Ladd and Murray. My dependent variable is the average per-pupil local revenue.¹ The explanatory variable of interest is a dummy variable for senior service levy, where the presence of the levy is a 1 and the absence is 0.

$$\text{LOCAL REV PER PUPIL} = \text{SENIOR LEVY} + (\text{CONTROL VARIABLES})$$

The years of observation are 1995 - 2006. There are a total of 1056 observations where 611 have a senior service levy in place. This is a balanced panel data set for all 88 counties in Ohio.

Table 2 – Bivariate Correlations – Competition between levies

N = 1056	Rev Per Pupil	Sen. Dummy	% 65+	% <17	% Owner occupied	Med. HH income 1999	% Non- white	% Urban
Rev Per Pupil	1							
Sen. Dummy	0.02	1						
%65+	-0.03	-0.13	1					
%<17	-0.06	-0.01	-0.28	1				
% Own	-0.22	0.06	0.06	0.47	1			
Income	0.47	0.02	-0.56	0.36	0.21	1		
%Nonwhite	0.49	-0.05	0.05	-0.29	-0.68	0.07	1	
%Urban	0.52	-0.04	-0.05	-0.35	-0.61	0.36	0.72	1
Mean	\$2,866		13%	19%	75%	\$39,602	6%	51%
Std. Dev.	\$1,291		2%	1%	5%	\$7,267	6%	24%
Minimum	\$807	0	8%	14%	57%	\$27,287	1%	2%
Maximum	\$9,652	1	19%	25%	87%	\$67,258	33%	99%

¹ Ladd and Murray actually use the total per-pupil revenue and control for the state share and the federal share of revenue. I use the direct local revenue as my dependent variable.

Findings

Hypothesis # 1 – The increasing senior population has a significant and positive impact on the passage of senior service levies.

Using a standard and robust linear regression technique, hypothesis #1 is rejected at a 5% level of significance. The percent of the population that is 65 and over is not a statistically significant predictor of levy passage. The fact that the proportion of the population 65+ is positively correlated with the percent voting ‘yes’ may reflect a desire by the general public to provide services when there are many seniors in the community.

Table 3

			N = 98
			F = 0.0612
Dependent variable = % of vote			R-sq. = 0.107
	Coefficient	P-value	
Tax Rate	-.0557	0.020	**
% 65 + voting population	.0059	0.132	
% 5-17	-.9436	0.350	
Median HH inc.	.0019	0.457	
Owner occupancy rate	-.3416	0.433	
% Nonwhite	-.1378	0.654	
% Urban	-.0003	0.639	
Intercept	.9373	0.000	

The F-value suggests that the model is significant at a 10% level, even though the majority of the variables are not statistically significant. The one variable that is statistically significant and negative is the tax rate, which is an expected outcome. The -.0557 coefficient on tax rate doesn't appear to be a strong risk factor when levies are passing by a 62% margin on average with a standard error of 9%.

The significant F-value combined with variables that are not statistically significant, and an R-squared that suggests the model describes only 10% of the variance in the percent voting 'yes', may further suggest a general willingness to pay by the public.

Practitioners believe that campaign efforts are the key factor in vote passage. Having a proxy for lobbying efforts may be the significant variable missing from the model.

Hypothesis #2 – The presence of senior service levies will have a negative impact on education levies.

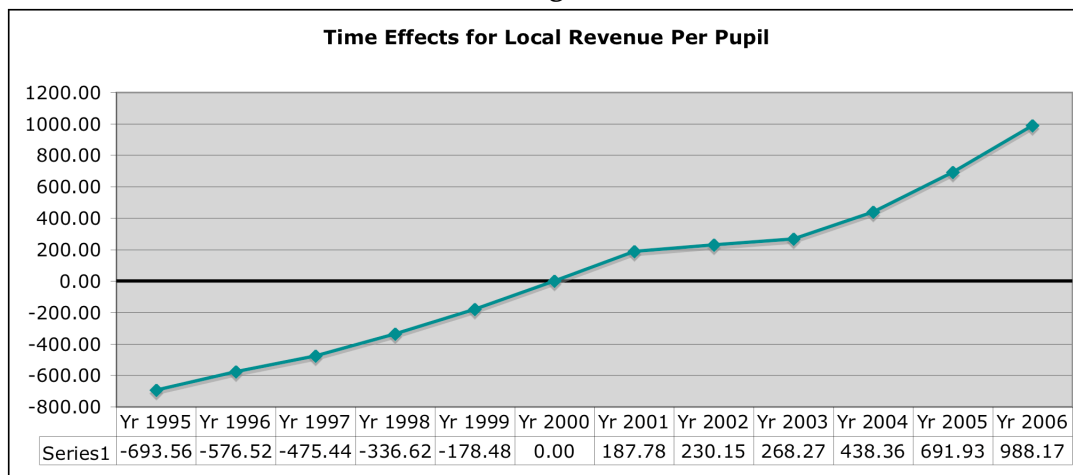
Using a standard and robust linear regression technique with fixed effects and controlling for time, the second hypothesis is rejected at a 5% level of significance. The presence of senior service levies does not negatively impact local per pupil revenue. In fact, the presence of senior service levies effects local per pupil revenue positively, lending support to my hypothesis that there may be a symbiotic tax benefit linkage effect. The coefficient on senior levy suggests that the presence of a senior levy equates to an increase in local per pupil revenue of \$76.87.

Table 4			N = 1056
			F = 0.000
Dependent variable = Local revenue per pupil			R-sq. = 0.4994
	Coefficient	P-value	
Senior levy	76.866	0.041	**
% 65	240.841	0.000	**
% 5-17	-74.531	0.316	
Median HH inc. (1000's)	140.631	0.000	**
Owner occupancy rate	-59.670	0.069	*
% Nonwhite	75.020	0.001	**
% Urban	-9.197	0.220	
Intercept	-67.682	0.975	
Fixed Effects	YES		
Time Effects	YES		

The regression coefficient for the %65+ is also positive and statistically significant. This contradicts the Ladd and Murray national study that found a negative relationship between %65+ and local revenue per pupil. Without going back and studying the same years as the Ladd study, I have no way of knowing if the positive coefficient is simply characteristic of Ohio or further support for the idea of symbiotic tax benefit linkages.

It is curious that some of the variables we would expect to see positively associated with local per pupil revenue are negative, specifically the %5-17 (not statistically significant) and the owner occupancy rate (statistically significant, 10%). This unexpected outcome may be the result of macroeconomic variables during the 12-year sample period of 1995-2006. If the time effects are a reflection of economic contraction, they may help to explain the unexpected negative coefficients. Figure 4 is a linear representation of the local revenue per pupil regressed on the time effects in the sample, where the constant is \$2,776.14 and statistically significant at the 5% level.

Figure 2



VIII. Conclusion

This research contributes to the body of knowledge available concerning senior service levies. Ohio's experience with local funding for senior services shows that such a funding stream is a viable alternative to full reliance on state and federal funding. As states and communities across the nation begin to look at the impact of an elder population and find a need for public provision of service, this research supports property tax levies as a legitimate way of providing locally tailored service to a growing population demographic.

It is difficult to determine if this research is generalizable since it looks at the experience of one state. In addition the limited number of years of voting data provides a small number of variables to predict determinants to passage. Because of the theory of ecological fallacy, where individual behavior cannot be predicted with aggregate data, this research cannot clearly predict the voting patterns of individuals within a community. For example, a senior service levy may get more votes 'yes' when the senior population increases because seniors are voting for their own self interests or because there are more seniors in the community that voters want to provide care for. Ecological fallacy could be controlled for in future studies with the availability of age disaggregated voting data.

Future research in this area would benefit from a larger sample population. Having a data set that included all five states currently allowing county senior service property taxes would increase the prediction power and the generalizability of this study. In addition, a proxy for campaign efforts may better define the model predicting passage of senior service levies.

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Appendix

Counties with Senior Service Levies



Source: Ohio Department of Aging

Dark Green = County with levy
Pale Green = County with a city or township that has a levy